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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/995,778	11/29/2001	Jee-hong Min	1293.1288	1689
21171	7590	12/10/2004	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			CHANG, AUDREY Y	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

2872

Office Action Summary	Application No. 09/995,778	Applicant(s) MIN ET AL.	
	Examiner Audrey Y. Chang	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4, 10, 17 and 32-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4, 10, 17 and 32-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **September 2, 2004** has been entered.
2. This Office Action is also in response to applicant's amendment filed on **August 24, 2004**, which has been entered into the file.
3. By this amendment, the applicant has amended claims 4, 10, and 17.
4. Claims 4, 10, 17, and 32-49 remain pending in this application.
5. The rejections to claims 17, 34, 37, 40, 43, 46, 49 under 35 USC 112, first paragraph, set forth in the previous Office Action are **withdrawn** in response to applicant's amendment.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 4, 10, 17 and newly added claims 32-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Machtig et al (PN. 5,782,547) in view of the patent issued to Myers (PN. 6,375,326) and Japanese Patent issued to Hiroshi (JP 411326822A).**

Machtig et al teaches a *display device* that displays *spatial objects* and **background image *simultaneously* to create *three dimensional illusion* wherein the display device comprises a *spatial object***

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display (100, Figures 5 and 9), and a *background image display* (120) together serve as the *first and second image sources* for displaying a spatial object image (110), serves as the first image and a background image, (124 as shown in Figure 6), serves as the *second image*. *The first and second image sources are inline*. The display device further comprises a first *beam splitter* (102), which *transmits* a portion of the first image and *reflects* a portion of first image. The *reflected* portion of the first image transmits through a first Fresnel lens (104) and reflected by a second beam splitter (106) to be projected to a second space (110) for observation. The background image generated by the second image source (120) is transmitted by the beam splitter (106) and projected via a second Fresnel lens (108) to a first space, (124), which is behind the Fresnel lens (108). The spatial object image and the background image are projected to *different* spatial locations such that when viewed simultaneously, the spatial object image appears to be *floating* in the space as against to the background image and such appearance give three-dimensional sensation.

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the spatial object (110) is produced by the *transmitted* portion of the image light via the first beam splitter and a *reflective* holographic element. The cited reference teaches to use a *reflected* portion from the first beam splitter and a *transmitting* Fresnel lens to create the floating appearance of the spatial object (110). One skilled in the art would understand the difference is a choice between *reflection mode* (cited reference) and *transmission mode* (claimed). The function of the Fresnel lens and holographic element is the same namely creating the floating appearance of the object. Myers in the same field of endeavor teaches a **transmission** mode of Fresnel image floater wherein the image source (10) is placed with respect to a first beam splitter (13) such that a *transmitted* portion of the image light from the beam splitter is transmitted to a Fresnel lens (11) and a plane mirror, (together serves as *reflective* Fresnel element), such that the light is reflected back to the beam splitter and further being reflected by the beam splitter to produce a floating image (14, Figures 3 and 4). In short, Myers teaches a

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transmission mode for creating the floating object image. It would then have been obvious to one skilled in the art to apply the teachings of Myers to modify the arrangement of Machtig to rearrange the beam splitter and the Fresnel lens to use a **transmission** mode of the image light to create the floating appearance of the object (110) as an alternative design for achieving the same image displaying effect, as an obvious matters of design choice.

Machtig teaches to use Fresnel lens but does not teach explicitly to use a holographic optical element with aspherical lens function to create the image floating appearance. Hiroshi in the same field of endeavor teaches an image display device wherein a *reflective holographic optical element* (10, Figure 7, and the abstract) having *aspherical lens function* is used with a beam splitter (7) to converge the image light to the *desired spatial* location and to introduce *aberrations* correction to the display device. It would then have been obvious to one skilled in the art to apply the teachings of Hiroshi to use a holographic optical element with aspherical lens function for the benefit of using an alternative element (holographic instead of Fresnel) to achieve the same image floating appearance and adding *aberrations* correction to the image display device to improve the image quality.

With regard to claim 17, Machtig et al teaches that the beam splitters (102 and 106 in Figures 5 and 9) are each making an *acute angle* with one of the image sources. However it does not teach explicitly that the reflective holographic element is also making an acute angle with respect to the beam splitter. Hiroshi does teaches that the image source, the beam splitter and the reflective holographic element can be arranged to have acute angle defined between image source and beam splitter and between beam splitter and the reflective holographic element, (please see Figure 7). It would then have been obvious to one skilled in the art to apply the teachings of Hiroshi to arrange the elements accordingly for the benefit of fitting them in a compact and optical correlated manners for operation.

With regard to claims 32-37, the Machtig et al teaches that the beam splitter partially reflects and partially transmits the image light, which therefore has half mirror functions. Although this reference

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does not teach explicitly that the beam splitter is made of a holographic element. However recording optical element as holographic optical element is rather common practice in the art, for one thing the nature of the holographic element provides more precise optical selectivity so that the optical function based on the selectivity will be more accurate. Such modification would therefore have been obvious to one skilled in the art for the benefit stated above.

With regard to claims 38-43, **Machtig et al** teaches that the spatial object image generated by the first image source is a *foreground* image and the appearance of the foreground image will be greatly enhanced if it is displayed against a *black background*, (please see column (9). This suggests that the foreground image is brighter than the background image.

With regard to claims 44-49, **Machtig et al** teaches that the foreground image could have *movement* to enhance the dimensionality, (please see column 9, lines 15-20).

Response to Arguments

8. Applicant's arguments with respect to claims 4, 10 and 17 have been considered but are moot in view of the new ground(s) of rejection.

9. Applicant's arguments are mainly drawn to the amendments to the claims and they have been fully addressed in paragraphs above.

Conclusion

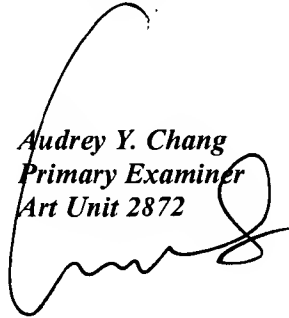
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Audrey Y. Chang
Primary Examiner
Art Unit 2872



A. Chang, Ph.D.